

Division of
WATER RESOURCES

Public
Workshop

Moapa Valley
Community
Center

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State Engineer

July 24, 2018

DEPARTMENT OF
**CONSERVATION &
NATURAL RESOURCES**



Water Use in the Lower White River Flow System

Topics

Impacted
Area & Why
We Are Here

Water Law
and Water
Management

Lower White
River Flow
System
(LWRFS)

Management
Options

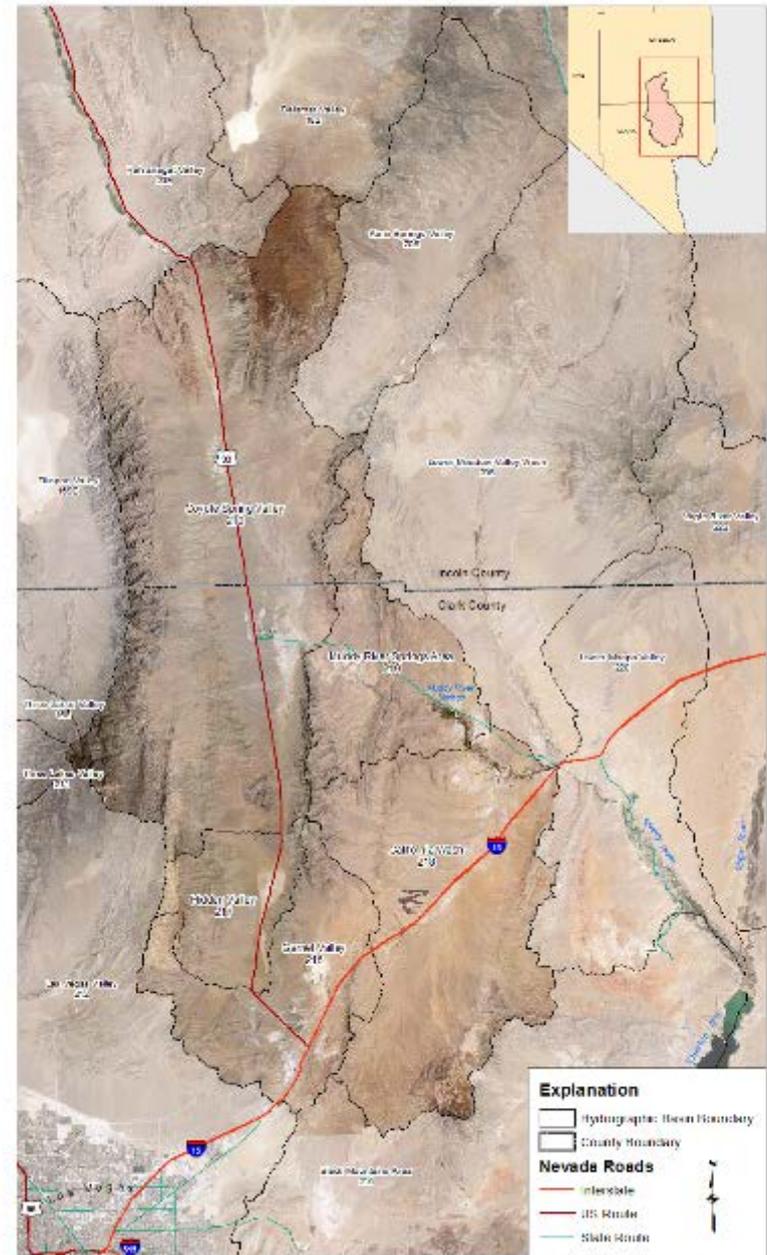
Impacted Area

LOWER WHITE RIVER FLOW SYSTEM

Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and a portion of Black Mountains Area

LWRFS

- Coyote Spring Valley
- Muddy River Springs Area (MRSA)
- California Wash
- Hidden Valley
- Garnet Valley
- Black Mountains Area (northwest portion)



Why Are We Here?

- >40,000 acre-feet in committed groundwater rights in the LWRFS
- Two year carbonate aquifer test of 10,200 acre-feet annually caused unprecedented
 - decline in high altitude springs, and
 - decline in groundwater levels

Why Are We Here?

- 5-year recovery data since the aquifer test shows water levels are relatively flat
 - 5-year pumping from carbonate wells has averaged ~7,000 af
- Based on the aquifer test, subsequent data collection and current development pressures, it is critical that a management strategy be implemented

Why Are We Here?

More Complications

The LWRFS is the *ONLY* region in the state where, because of the close hydrologic connectivity between basins, our office has determined that all the basins need to be managed as one.

Water Law and Water Management

Nevada Water Law

- Prior Appropriation
 - First in **time**, first in **right**
- Priority Date
 - Date application filed for new appropriation
 - Date domestic well completed
 - Date pre-statutory right first placed to beneficial use

Nevada Water Law

Application



Permit



Certificate

Nevada Water Law

- Beneficial Use
 - The **basis**, the **measure** and the **limit** of the water right.
- Use it or lose it:
 - Cancellation
 - Forfeiture
 - Abandonment

Management Tools for Over-Appropriated Basins

- NRS 534.110(6)—Regulation by priority (“curtailment”)
- NRS 534.110(7)—Critical Management Area
 - Approvable Water Management Plan
 - Or, after 10 years, curtailment

Management Tools

–NRS 534.030— Basin Designation

–NRS 534.120— Orders and Rules for Designated Basins

Statutory Directives

- NRS 533.024(1)(c)—Best available science
- NRS 533.024(1)(e)—Conjunctive management
- NRS 534.020—Groundwater management

Perennial Yield

State Engineer's estimate of PY is used to help determine the amount of groundwater available in a hydrographic basin.

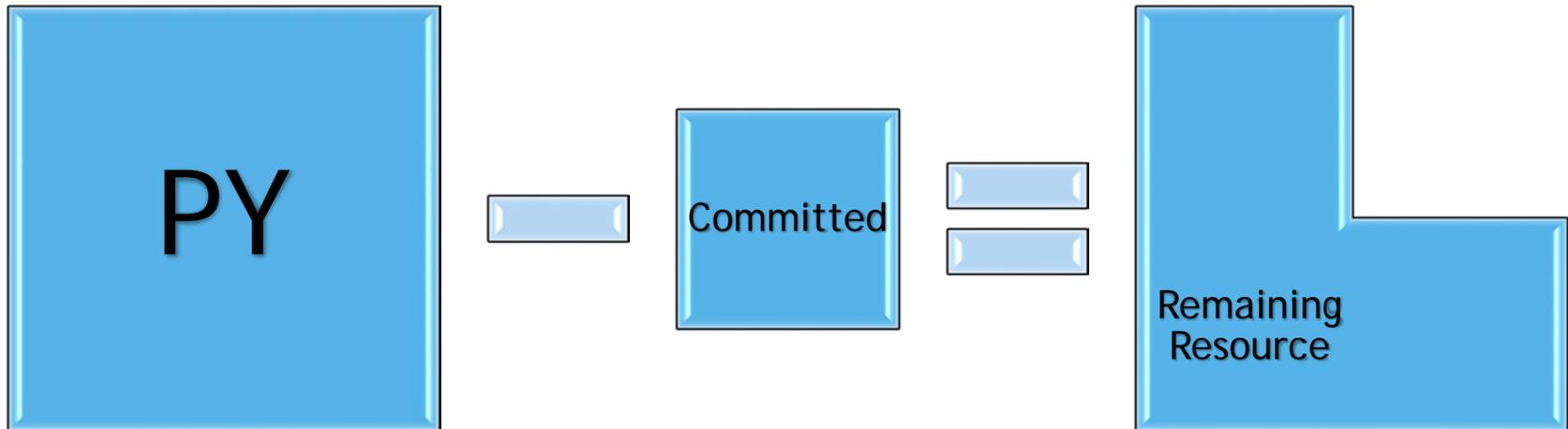
Perennial Yield

- The maximum amount of groundwater that can be withdrawn each year over the long term without depleting the groundwater reservoir.
- The goal is to not approve more groundwater rights and the drilling of domestic wells than the basin's perennial yield.

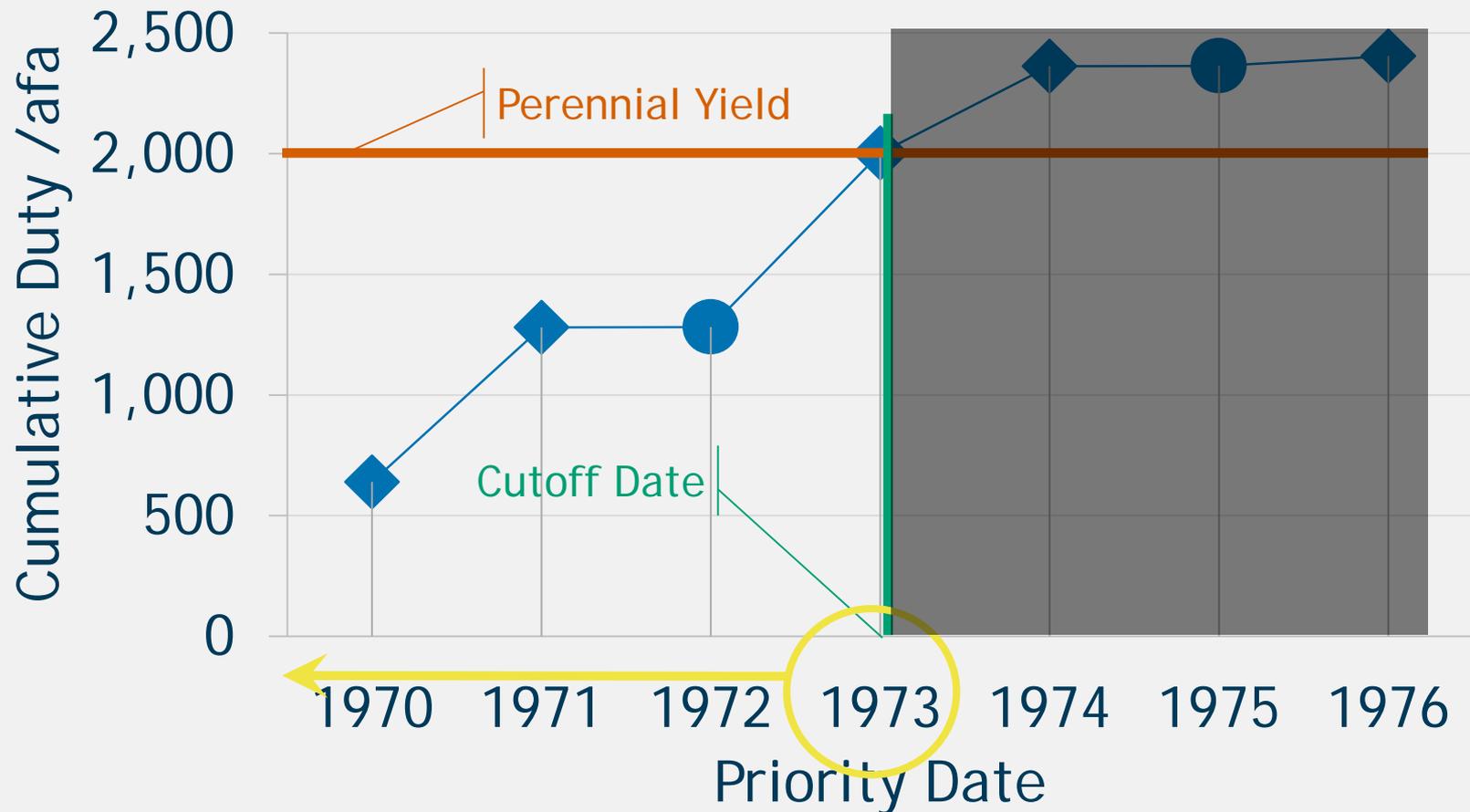
Groundwater Management

–Basin-by-basin basis

(but remember, the LWRFS consists of 5+)



Prior Appropriation



Surface and Underground

NRS 533

- General provisions
 - Adjudications
 - Appropriations
- Focused on surface water

NRS 534

- Groundwater specific
- Well drilling
- Domestic wells
- Designation

Conjunctive Management

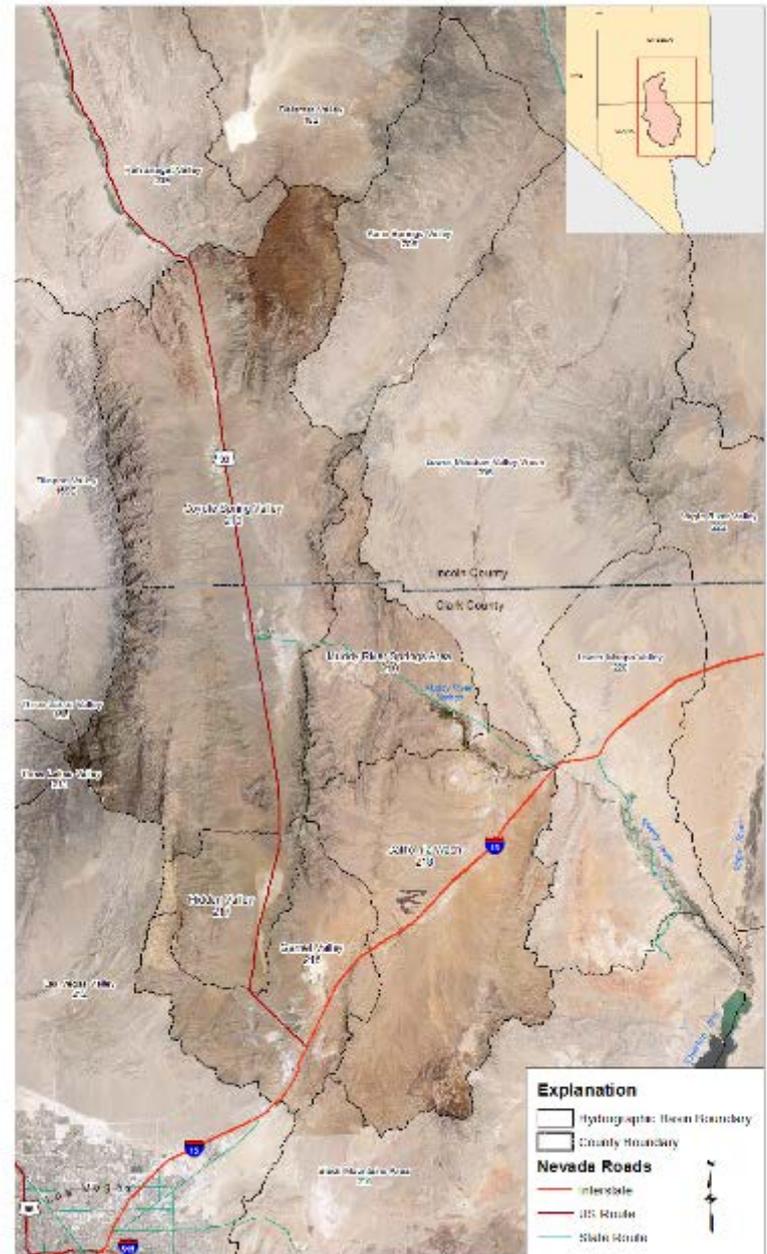
NRS 533.024(1)(e)

“It is the policy of this State...[t]o manage conjunctively the appropriation, use and administration of all waters of this State, regardless of the source of the water.”

Lower White River Flow System (LWRFS)

LWRFS

- Coyote Spring Valley
- Muddy River Springs Area (MRSA)
- California Wash
- Hidden Valley
- Garnet Valley
- Black Mountains Area (northwest portion)



Carbonate and Alluvial Aquifers

Carbonate Aquifer

- Old (~400 million years) sedimentary rocks composed of carbonate minerals
- Limestone and dolomite
- Much of the bedrock and mountain ranges of Eastern Nevada are formed from carbonate rocks
- The rock itself is almost impermeable but fractures or solution cavities can be large and highly productive

Alluvial Aquifer

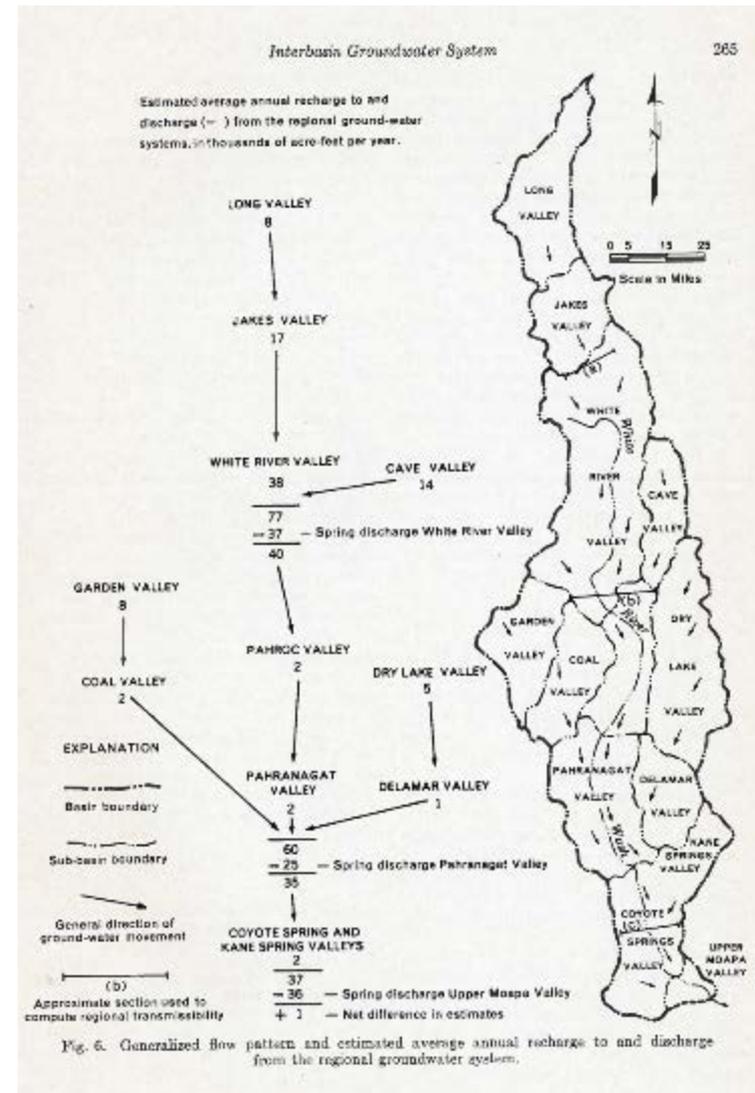
- Young (<5 million years) unconsolidated material deposited by flowing water
- Sands/gravels/clays
- Valley floors are generally composed of alluvium, forming the aquifers for most shallow wells.
- Variable permeability depending on composition

Our office did NOT distinguish between aquifers when issuing water rights!

Early Water Resource Studies

- Eakin (Bulletin 33, 1966)
 - Estimated water budget for the WRFS
 - Inflow to MRSA 37,000 af
 - Subsurface outflow nil

- Rush (Recon 50, 1968)
 - Local recharge and water budgets in the LWRFS



LWRFS Carbonate Aquifer

In the 1980s and 1990s, water managers in Nevada were hopeful that the carbonate-rock aquifer system in the LWRFS would provide a new, abundant source of groundwater that could be used to address Southern Nevada's water shortage.

LWRFS Carbonate Aquifer

- Because the prospect of the LWRFS carbonate was great, nearly 100 water right applications for over 300,000 acre-feet were filed in our office.
- July and August 2001 hearings on water right applications.

Order 1169 and 1169A

- March 8, 2002
 - Order 1169
 - Hydrographic Basin Nos. 210, 215, 216, 217, 219, & 220
 - Groundwater applications held pending aquifer test
- April 18, 2002
 - Ruling 5115 added Basin 218

Order 1169 and 1169A

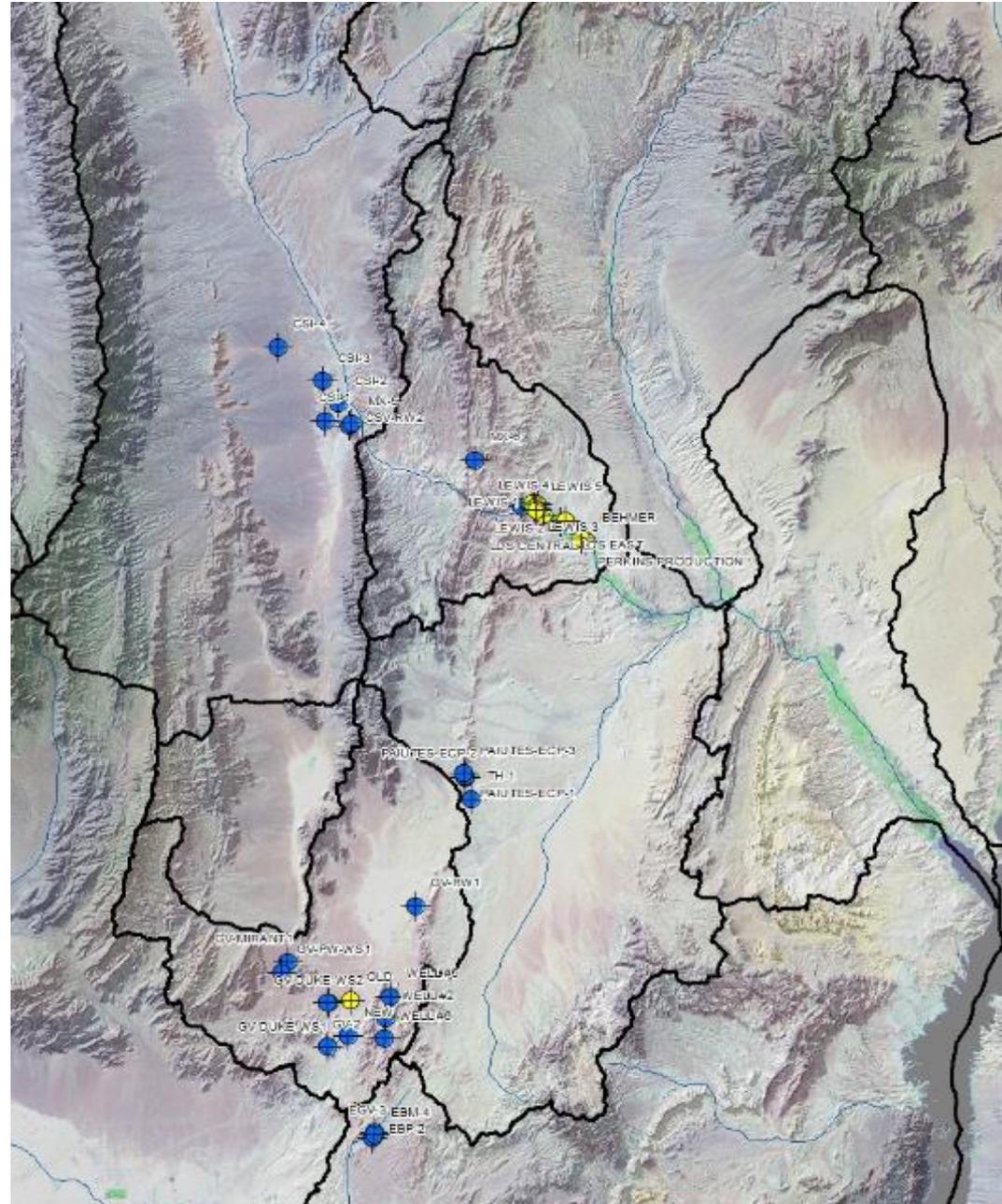
- November 15, 2010
 - Aquifer test begins
- December 21, 2012
 - Order 1169A
 - Test completed on December 31, 2012
 - 25½ months
 - Report filings by June 28, 2013

Order 1169 and 1169A

- Participants in the Aquifer test
 - Southern Nevada Water Authority/LVVWD
 - Moapa Valley Water District
 - Coyote Springs Investments, LLC
 - Moapa Band of Paiutes
 - Nevada Power Company

Pumping Areas

- 5,300 afa in Coyote Spring Valley
- 10,200 afa total carbonate pumping
- 3,700 afa alluvial pumping

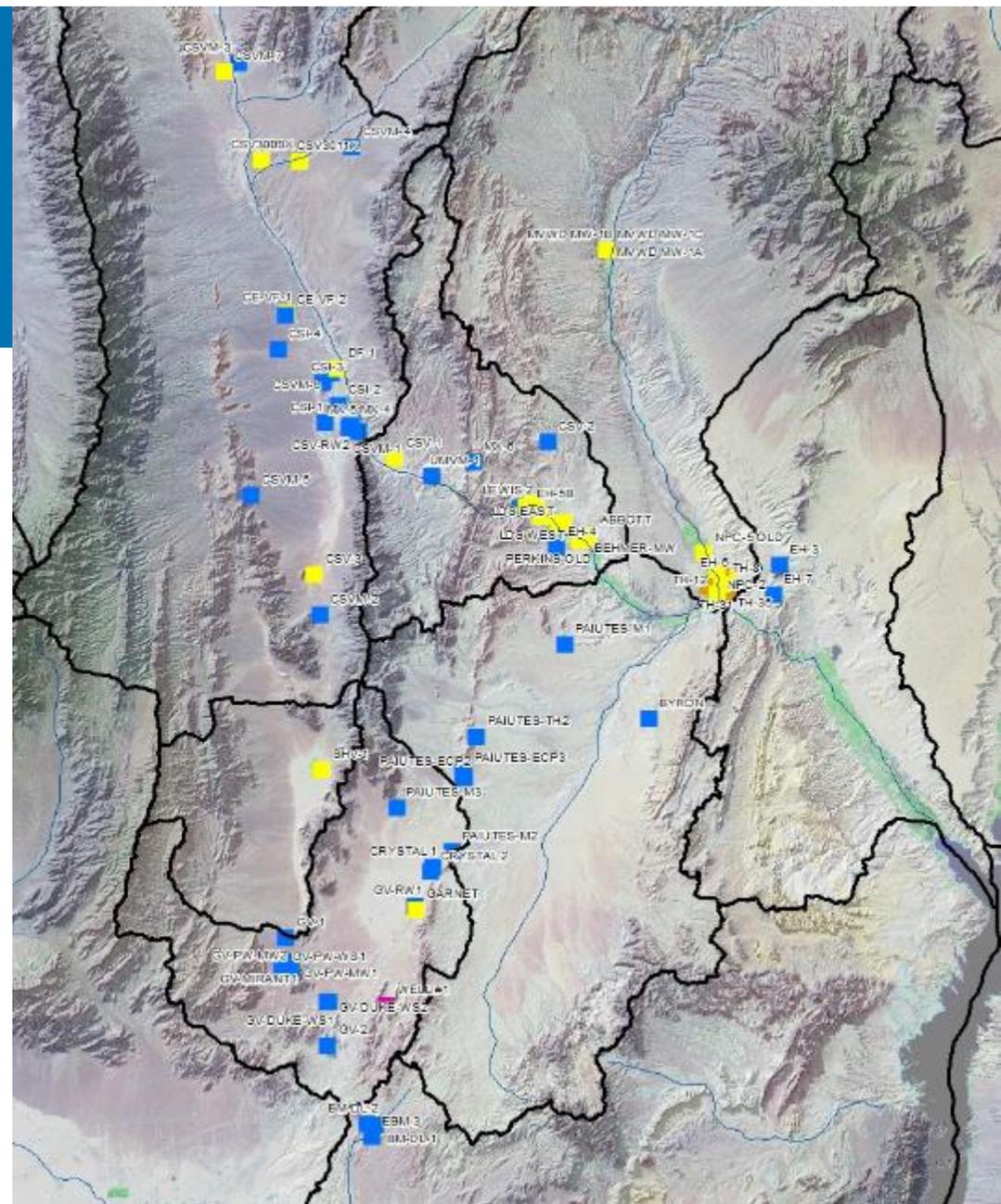


Monitoring Sites

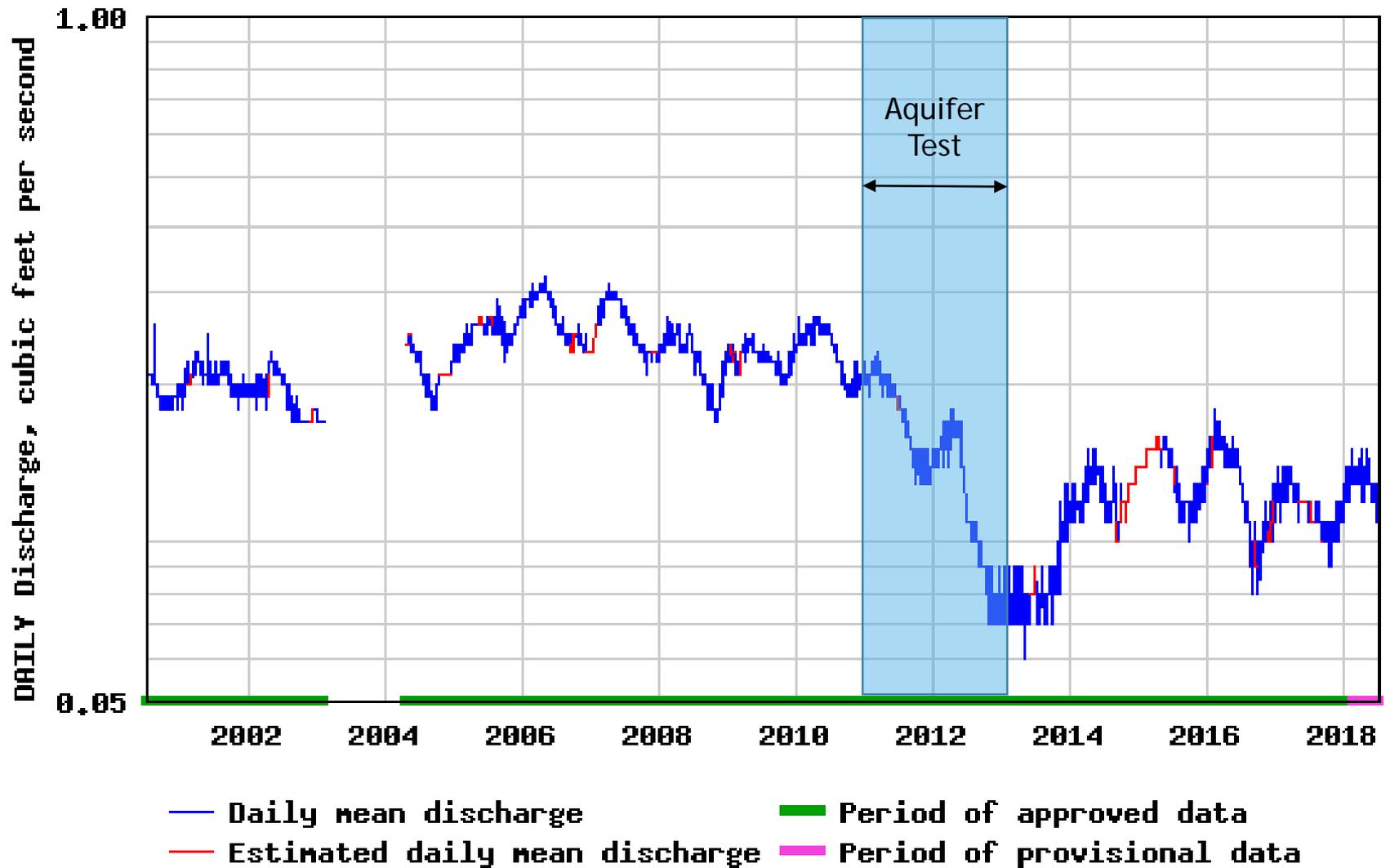
79 monitoring wells

- carbonate
- valley-fill

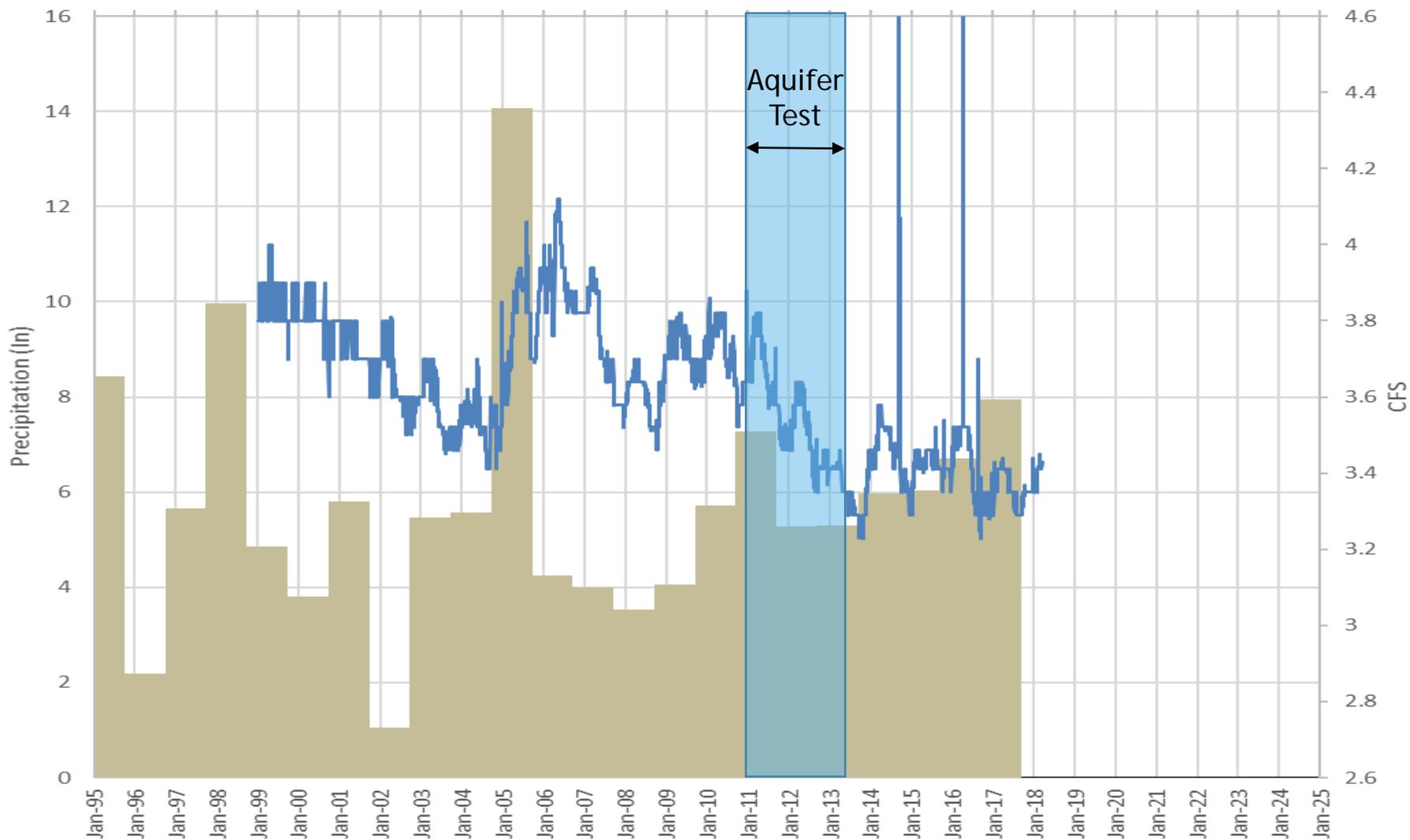
11 springs and
streamflow
monitoring sites



USGS 09415910 PEDERSON SPGS NR MOAPA, NV



WARMS SPRINGS WEST VS PRECIPITATION

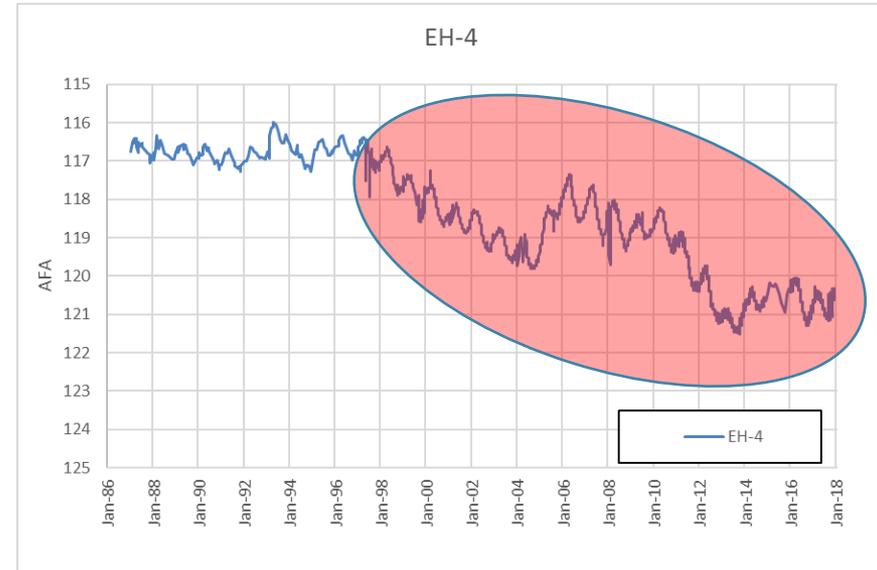


Water Levels vs. High Altitude Springflow

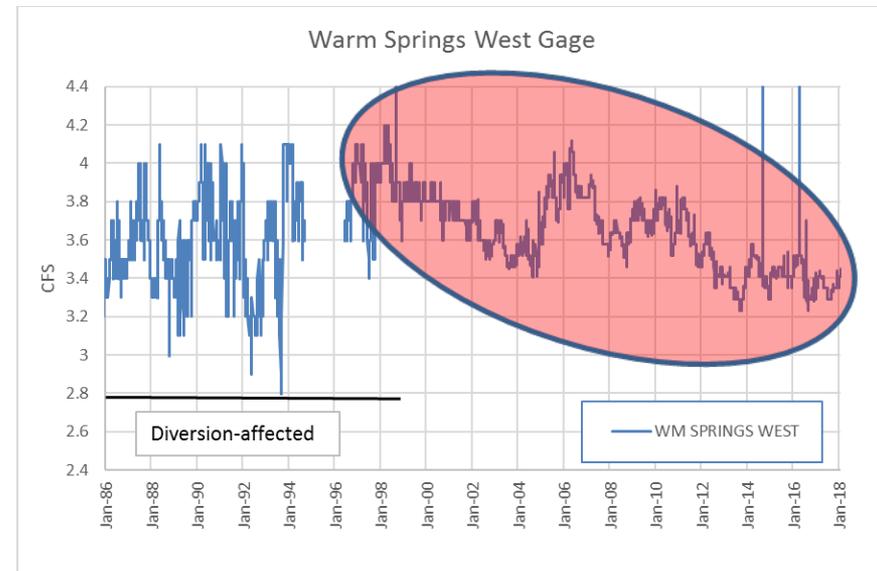
- Springflow mirrors water levels in carbonate aquifer

***DECREASING WATER LEVELS
DRIVES DECREASING
SPRINGFLOW***

Water Levels



Warm Springs flow

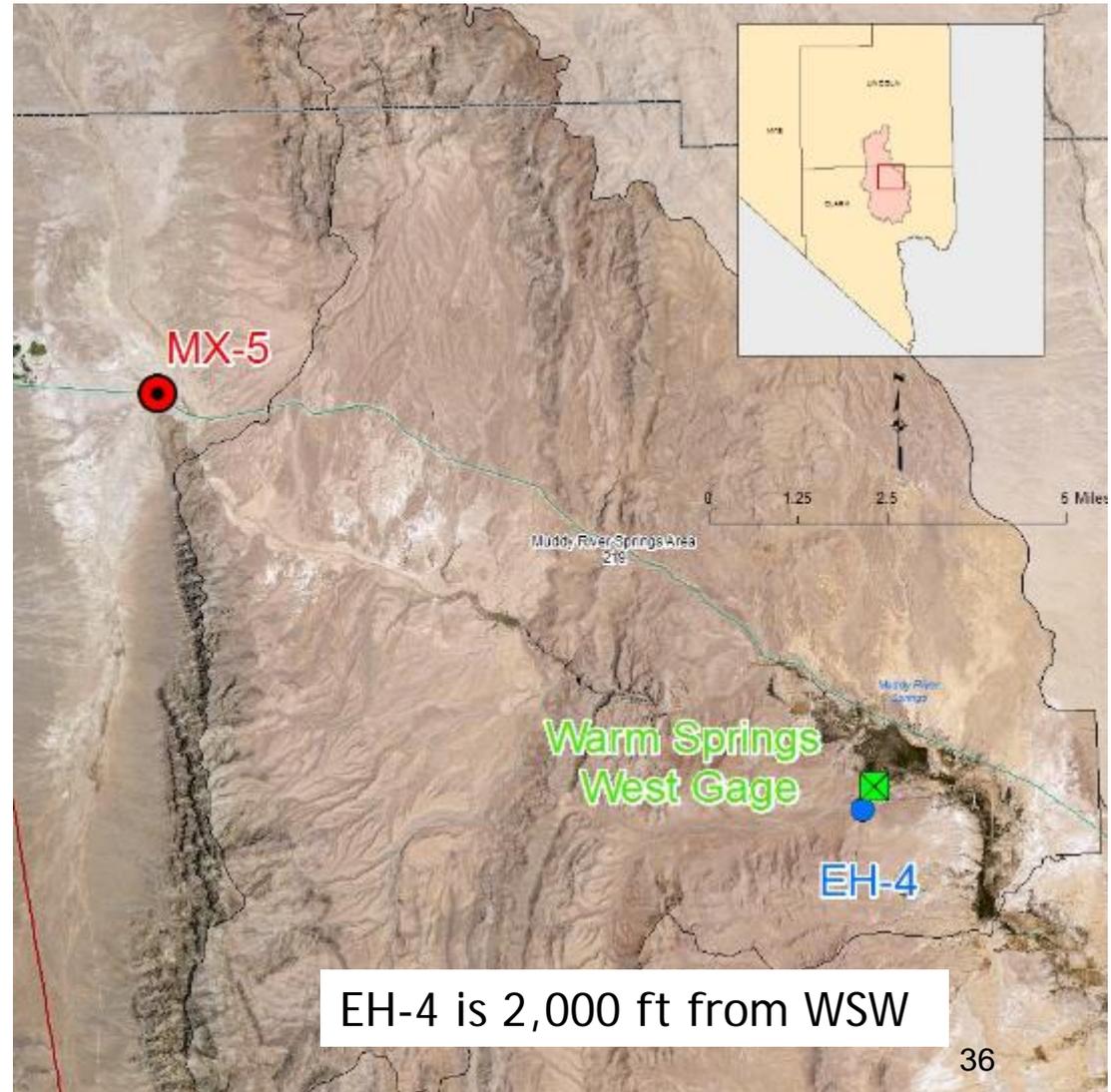


Aquifer Test Results

- Reports provided to the State Engineer
 - Southern Nevada Water Authority
 - U.S. Department of Interior Bureaus
 - Fish and Wildlife Service
 - National Park Service
 - BLM
 - Moapa Band of Paiutes
 - Moapa Valley Water District
 - Coyote Springs Investment, LLC
 - Great Basin Water Network
 - Center for Biological Diversity

Analysis of 1169 results and data

- What does 1169 aquifer test results tell us about limitations on pumping from a conflict/threat perspective?
- State Engineer focused analysis on correlation between pumping and spring flow



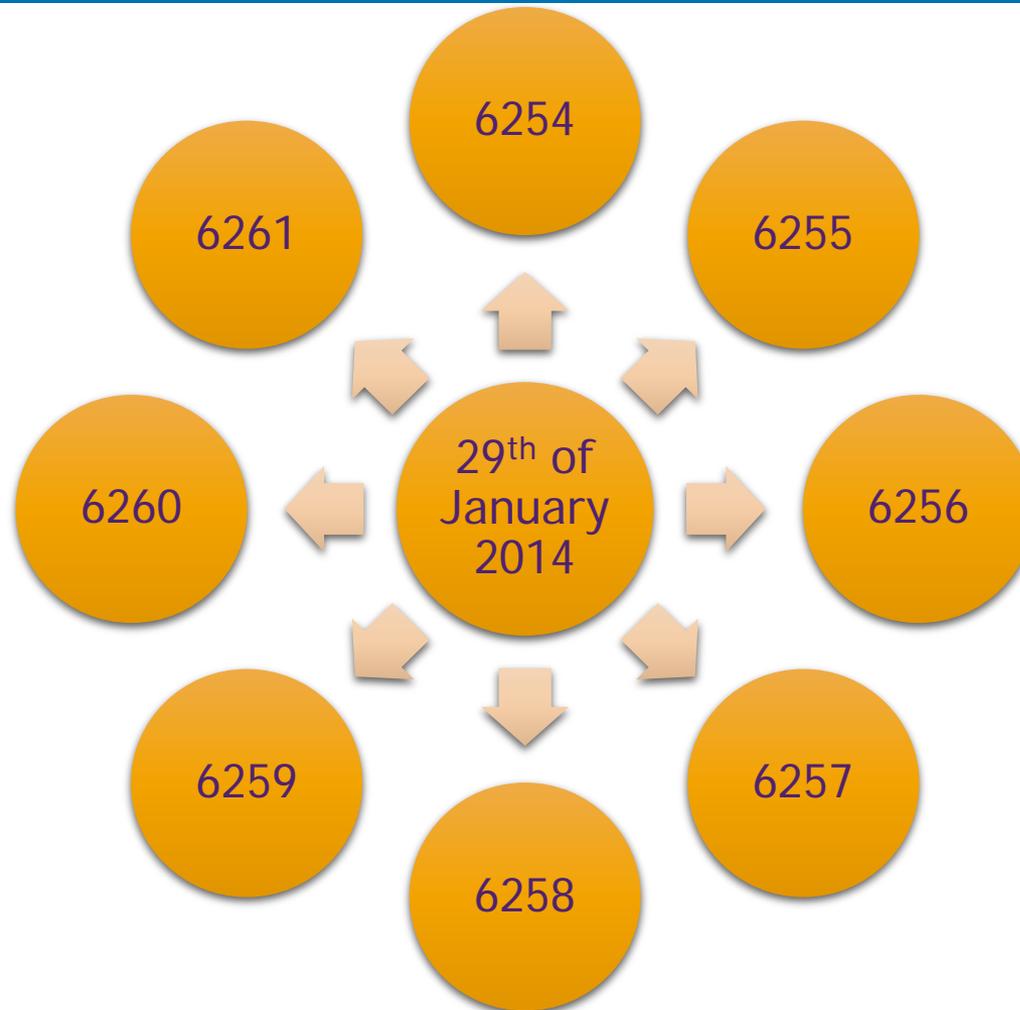
Aquifer Test Results

- Unprecedented decline in high-altitude springs
- Unprecedented decline in water levels
- None of the parties to the aquifer test reported that additional pumping in the central part of CSV or MRSA could occur *without* conflict with existing rights or dace habitat
- Interpretations of results – not entirely in agreement
- Demonstrated that the LWRFS basins are *very well connected*

Remember,

- >40,000 acre-feet in committed groundwater rights in the LWRFS
- Two year carbonate aquifer test of 10,200 acre-feet annually caused unprecedented decreases in spring flows and water levels

State Engineer Rulings



State Engineer Rulings

- The basins to be jointly managed
- Denied all pending applications in the LWRFS—NRS 533.370(2)
more than 300,000 acre-feet
 - No unappropriated groundwater
 - Conflict with existing rights
 - Threaten to prove detrimental to the public interest

Current Estimated Water Budget

Total Supply 50,000 afa or less

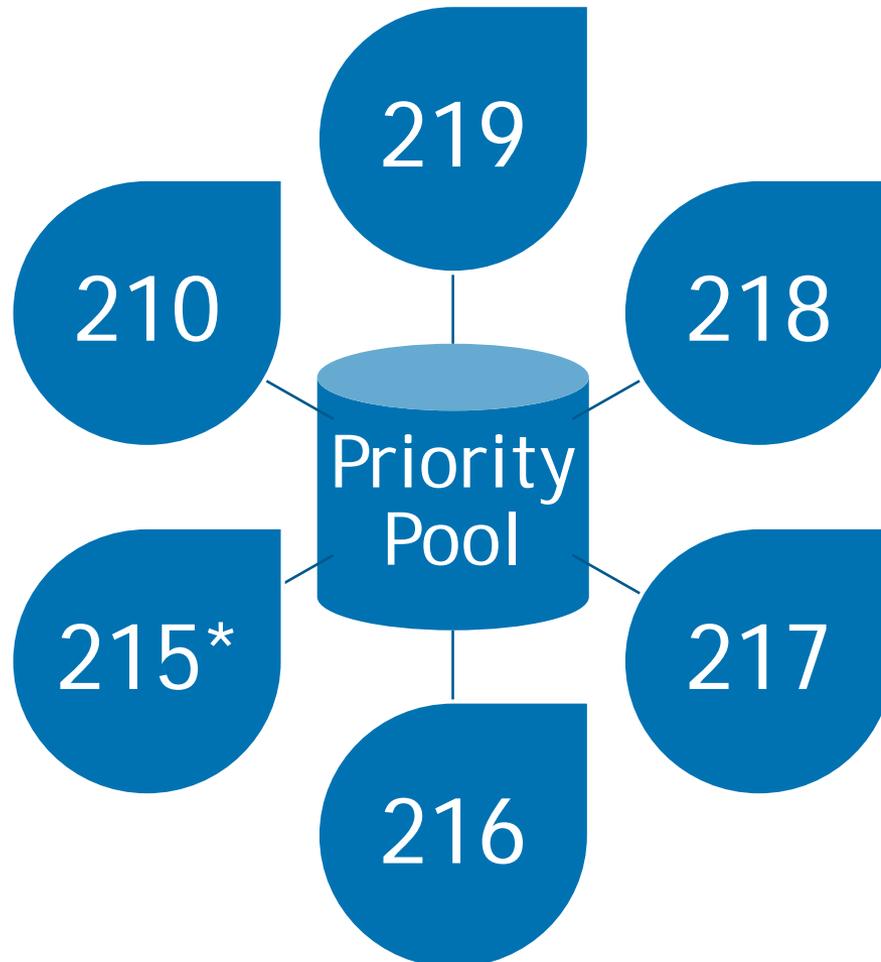
INFLOW:

<i>Subsurface groundwater inflow</i>	<i>47,502</i>
<i>Local Recharge</i>	<i>2,998</i>

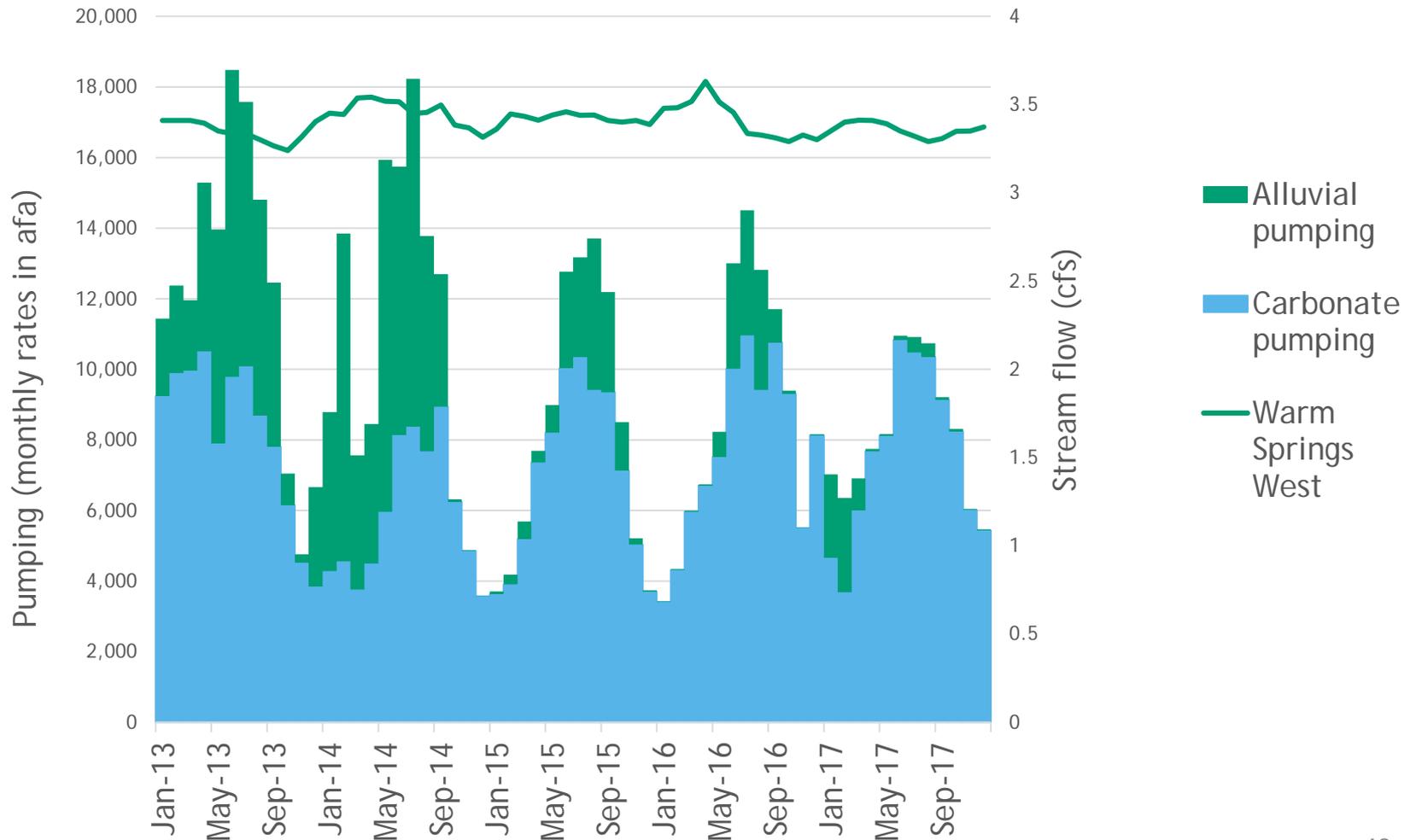
OUTFLOW:

<i>Muddy River streamflow</i>	<i>33,700</i>
<i>Muddy River Springs Area ET</i>	<i>6,000</i>
<i>California Wash ET/Subsurface outflow</i>	<i>~10,000</i>

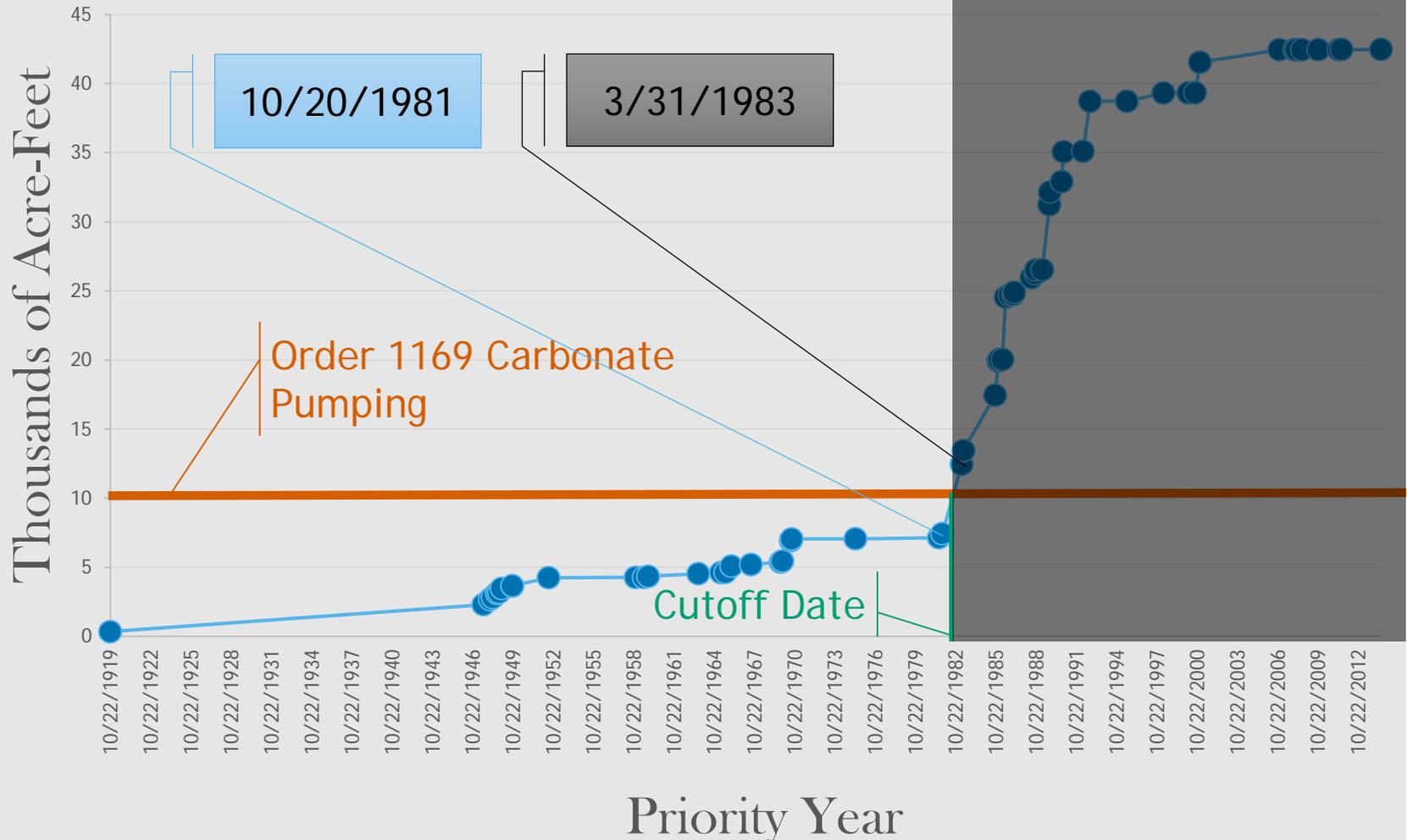
Joint Management



Trends since the end of the aquifer test



Existing Appropriations in the LWRFS



Muddy River

- Fully appropriated under the Muddy River Decree
- Most senior priority water rights
- Hydrologically connected to the alluvial fill aquifer

More Complications

Moapa dace (*Moapa coriacea*)

Not to Scale



Illustration by Joseph R. Tomelleri

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae
Genus: Moapa
Species: coriacea

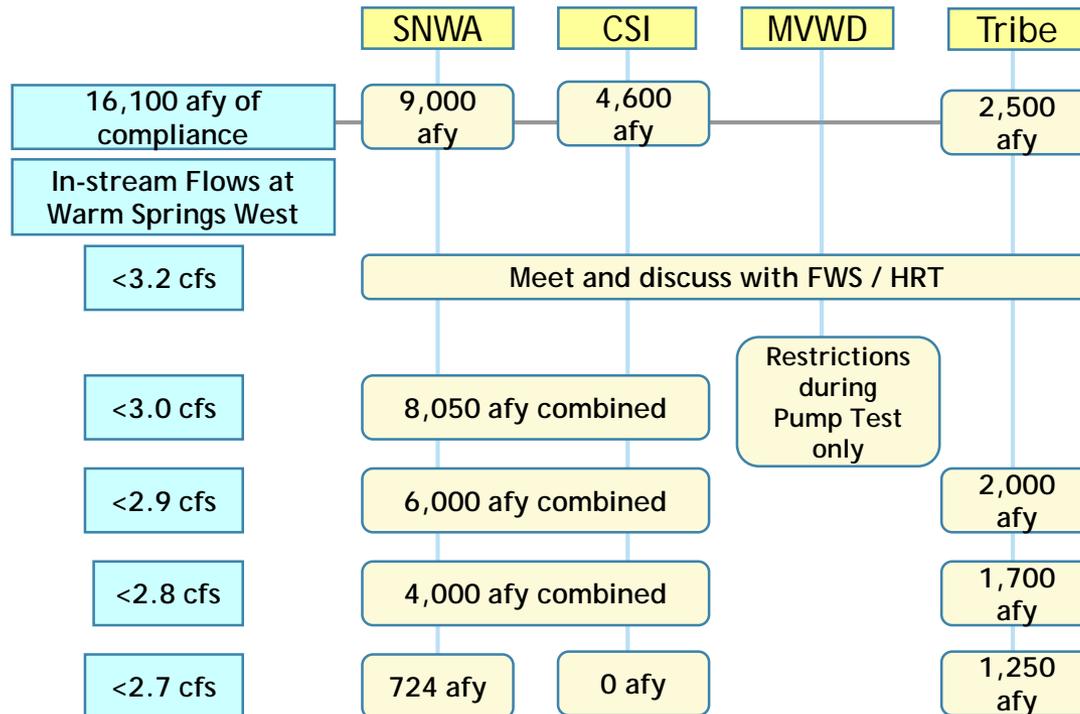
Length: up to 4.7 inches
Lifespan: 4+ years
Feed: omnivorous

Habitat: a variety of habitats in the Warm Springs area

2006 Muddy River Memorandum of Agreement (“MOA”): Reducing Groundwater Pumping

- Fish and Wildlife Service anticipated the Aquifer Test in Order 1169 and Order 1169A may affect the Moapa dace
- Agreement to implement conservation measures in advance of Aquifer Test
- ESA’s Biological Opinion analyzed the impacts of 16,000 acre-feet of groundwater pumping on the Moapa dace’s habitat and established “Trigger Ranges” that require pumping to be slowed or ceased at various sites if water flow fell, as measured at the Warm Springs West flume, below certain levels needed for the Moapa dace

MOA triggers



Source: SNWA

What does this mean for Water Users?

- ESA-based enforcement actions could require long-established water users to obtain *take permits* that give up all or a portion of their water for the benefit of the Moapa dace.
- Water users that cause direct harm to the Moapa dace are potentially subject to harsh civil and criminal penalties from the federal government.

Related Issue

- Las Vegas Valley Water District (LVVWD) sent our office a letter in November 2017
- Coyote Springs Water Resources General Improvement District (CSWRGID)
- Subdivision map approval

State Engineer's Responsibility as it Relates to Subdivisions

- NRS 278.335(1)—Tentative subdivision map approval
- NRS 278.377—Final subdivision map approval

State Engineer's Responsibility as it Relates to Subdivisions

DIVISION OF WATER RESOURCES CERTIFICATE

THIS PLAT IS APPROVED BY THE STATE OF NEVADA DIVISION OF WATER RESOURCES OF THE DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES CONCERNING WATER QUANTITY, SUBJECT TO THE REVIEW OF APPROVAL ON FILE IN THIS OFFICE.

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Related Issue

In responding to the LVVWD letter, our office considered:

- Aquifer test data and analysis
- Recovery period data
- That under the MOA, a self-imposed curtailment tied to spring flow triggers may limit water supply in the LWRFS
- Requirement to protect senior water rights

Related Issue

- State Engineer's May 2018 response addressed LVVWD's specific question relating to the sustainable development of groundwater for an entire project
 - Based upon that question presented, the State Engineer cannot justify approval of subdivision maps based on junior priority water rights without the identification of other water sources for development
- Triggered litigation

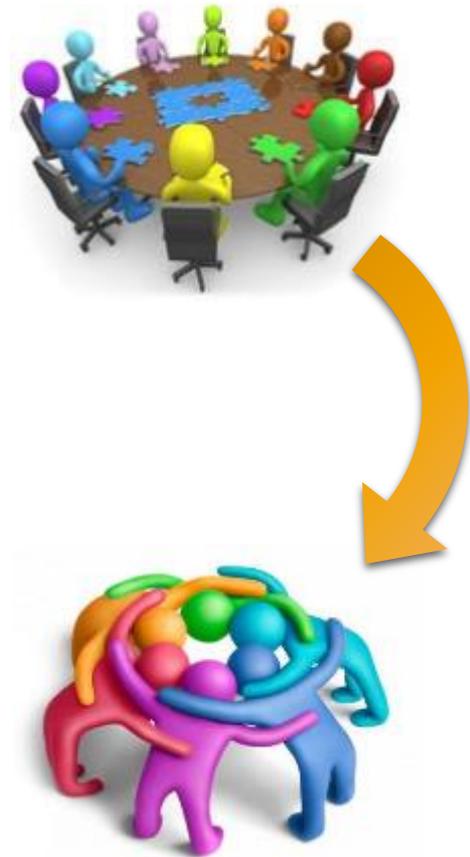
What is “our” goal?

Maximize
Beneficial Use
of Water
Resources

Protect Senior
Water Rights

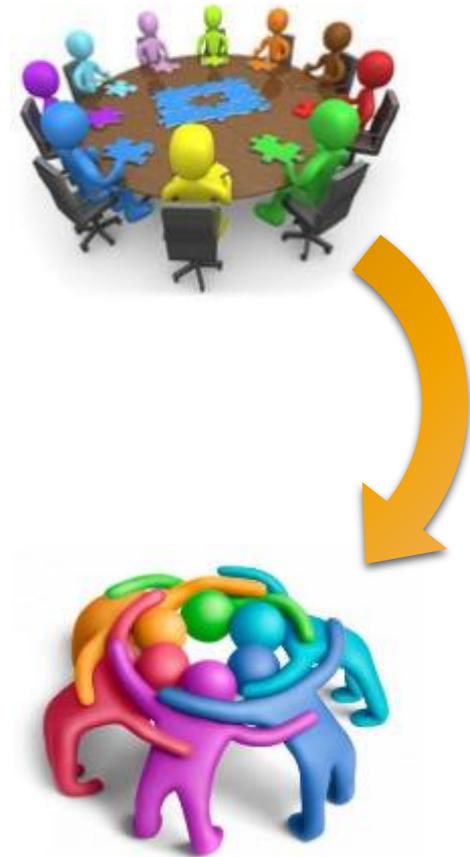
Options

- Use existing expertise
 - Hydrologic Review Team (HRT) currently collecting data and interpreting pumping effects on the Muddy Springs and the dace
 - Establish a working group consisting of HRT members and other interested parties to begin drafting regulations for a conjunctive use management plan
- Establish groundwater pumping thresholds and monitor springs



Options

- Identify other sources of water, i.e. interbasin transfer of other groundwater or surface water
- Support stakeholder developed groundwater management plan
- Reduce active groundwater rights
 - Curtailment, relinquishments, cancellation, forfeiture





Stakeholder and Public Input

Next Meeting